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DFS-5904
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CMCC 151X5.1294
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25 November 1958

To: Headquarters, Attention Commo

From: R-W

Subject: Flight Test of an S-Band Traveling Wave Tube Receiver

Test Set-Up. An S-band antenna, a traveling wave tube amplifier, a System 1 video amplifier and pulse stretcher were installed in an aircraft "looking left." The output of this receiver was recorded on one track of a 3-track tape recording. For purposes of comparison, a standard System 1 crystal video receiver was installed "looking right" and recorded on a second track of the 3-track tape recording. A 1-kc clock tone was recorded on the center track of the tape recording. Superimposed upon the center track was a 3-kc tone proportional to an AGC voltage derived from the traveling wave tube.

The flight was conducted on 4 November 1958. A drawing of the flight plan accompanies this letter. Just before the beginning of the flight, the entire system including the recorder was tested. Using a test frequency of 3000 megacycles, the traveling wave tube receiver and the crystal video receiver were tested by applying succeedingly lower amplitude signals, playing back the tape, and determining from playback the minimum detectable signal. Using this method, the system tangential sensitivities were -66 dbm and -49 dbm respectively.

The tape was spot-checked only to the extent of determining that signals were present on all three tracks. It was noted that the AGC tone was present and that the left side had considerably more intercepts than the right side. No further analysis was made.

The 10-minute leg due north from Tucson, Arizona, was intended to expose alternately the left and the right side to the distinctive V-beam radar on San Clemente Island.

A set of Ampex 3-track playback equipment was loaned to Dr. William Rambo, Stanford University. The tape from the flight test was also sent to Dr. Rambo and a complete analysis was made by [redacted] has the tape in his possession. 25X1A9a

During an analysis of the tape it was determined that the recording head was probably loading down the AGC tone. This does not affect the operation of the receiver, but it did limit the recorded AGC data. A modified output circuit will be utilized and the traveling wave tube amplifier will be flown only for the purpose of observing the AGC action. This will be accomplished in conjunction with tests on the "Granger black box." No additional funding or personnel will be required.

Paul A.



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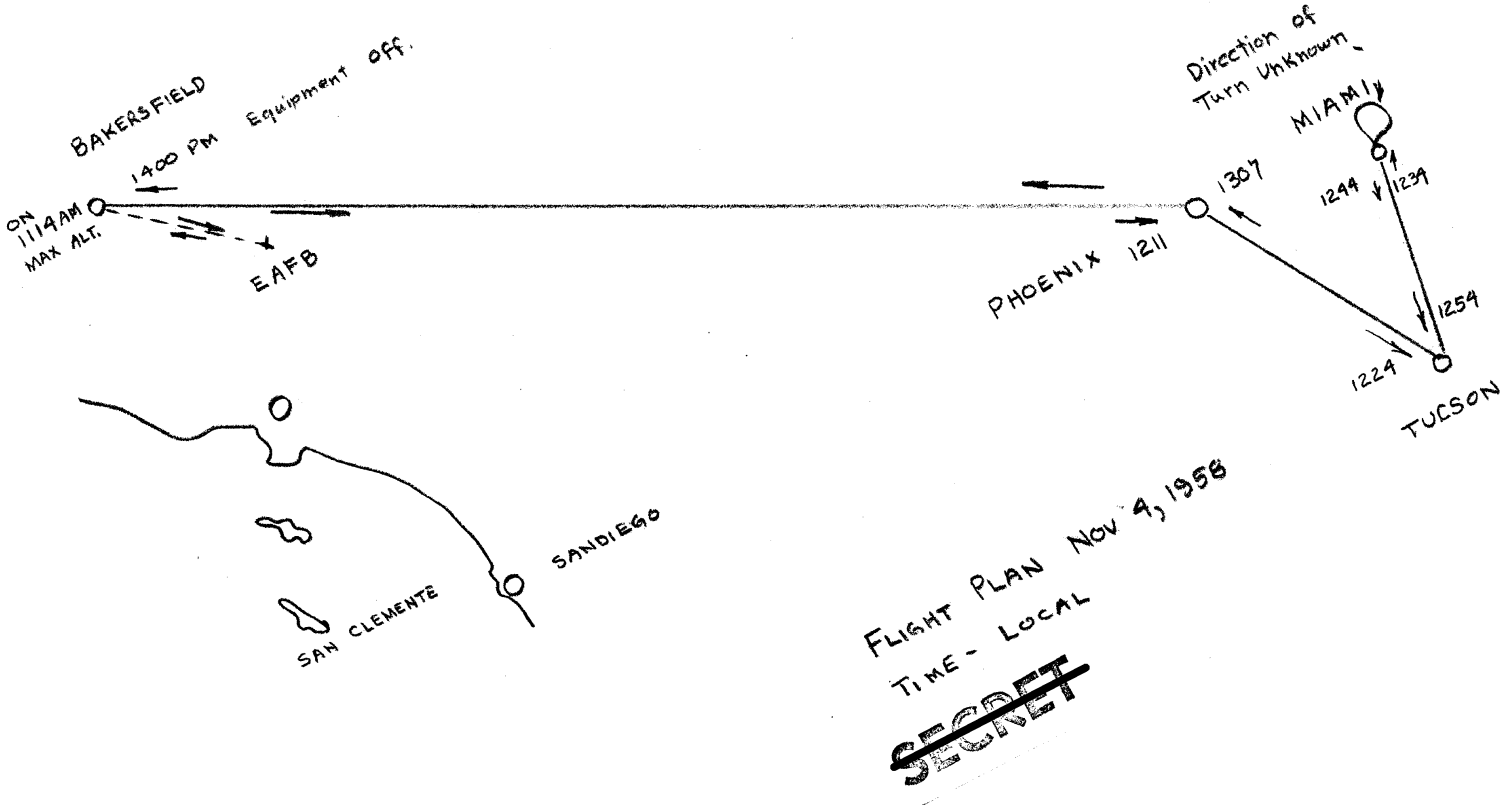


FLIGHT PLAN NOV 4, 1958
TIME - LOCAL

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